

**METHOD, APPARATUS AND SYSTEM FOR  
HIGH-SPEED TRANSMISSION ON FIBER OPTIC CHANNEL**

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ABSTRACT OF THE DISCLOSURE

Multi-carrier modulation fiber optic systems constructed using a series of electrical  
10 carriers, modulating the data on the electrical carriers and combining the carriers to form a  
wideband signal. The wideband signal can then be intensity modulated on a laser and  
coupled to a fiber optic channel. A receiver may then receive the laser signal from the fiber  
optic channel and convert it into an electrical signal. Multi-carrier modulation may be  
15 applied to existing fiber channels, which may be of lower quality. Existing fiber channels  
may have characteristics which prevent or restrict the transmission of data using intensity  
modulation at certain frequencies. An adaptive multi-carrier modulation transmitter may  
characterize an existing fiber optic channel and ascertain the overall characteristics of the  
20 channel. The transmitter and receiver can then be configured to use various bandwidths and  
various modulations in order to match the transfer characteristic of the fiber channel. A  
series of adaptive multi-carrier modulation transmitters and receivers can be integrated on a  
single integrated circuit. If multiple adaptive receivers and transmitters are integrated on a  
25 single integrated circuit, they may be used to upgrade existing networks by adding different  
wavelength lasers for the transmission of data in order to achieve any capacity desired. Each  
receiver and transmitter may characterize the fiber for its particular wavelength laser and may  
30 configure the modulation and bandpass to the fiber's characteristics.

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